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252 stones, covers them with dampened grass, and heaps a mound of earth over all. If she does this in the morning, the food will be thoroughly steamed by evening.

[251] After the stalks have been cooked this way, they may be sun-dried and kept for some time, even for a year, in a parfleche. When they are wanted, they are soaked in water to soften them and eaten. Or they may be eaten immediately after they have been baked—often pounded—while they are still soft, with fruit from the broad-leafed yucca or some other fruit. This stalk is not the favorite vegetable, but it becomes important when other food is scarce.

[262] Available at this time also are the white rootstocks and the tender lower portions of the shoots of the tule. These are boiled with meat or made into a soup. "We boil the root with a soup bone as some people do turnips." The root is sometimes dried and stored.

[262] By now the clusters of white flowers of the narrow-leafed yucca are in bloom. These are gathered and boiled with meat or bones. Any surplus is boiled, dried, and stored. The buds of still another variety of yucca (unidentified) are opened and dried.

[251] During the process they must be impaled on sticks "as you dry
[263] peaches; you cannot put them on a hide because they would stick to it. . . . . These are used to sweeten drinks." The drinks are various kinds of "tea" to be discussed presently.

[262] Not long after this an important food, the agave, century plant, or, as it is more commonly known, the mescal, is ready. The stalks, before any blossoms appear, are cut and roasted or pit baked like yucca stalks, but much more important as a food is the lower portion or crown. If the women live far from the [484] place where mescal is plentiful, they make a long trip to obtain it, establish a temporary camp, and prepare it there before returning home. When many crowns are to be baked, a large pit must be dug and many rocks transported to it; therefore, men sometimes accompany the party to assist with this heavy labor. [462] Whether men are present or not, the women are in charge of the proceedings:

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The acorns of both the Gambel oak and the live oak are valuable foods, for the acorn is used in a kind of pemmican:

In the autumn the women wait until the acorns are ripe and fall to the ground. Then they gather many of them and bring them in. Some people leave them in sacks just as they are when gathered and later crack the shells with their teeth and eat the nuts.

But some roast the nuts a little, crack them, and put them out in the sun to dry. Then they use the nuts with the dry [jerked] deer meat and some fat. First they pound the dry meat on a rock and mix it with a little fat. Then they take the acorn meats and pound them up fine. After that they mix the meat and the acorns together. They shape it like meat balls, and these keep all winter. If they are camping in any place, they can have it for any meal. When it is made this way it is all ready to eat at any time. You eat it just as it is. Because it is all prepared, it is a good thing to take on a journey. When a big group is on a journey and a child is hungry, they give it some of this.

During the summer and fall the women gather various greens for flavoring stews and soups. Lamb's quarter is one of these. It is cooked with meat or bones, chili, and onions. Locust pods, the white seeds of the anglepod, the seeds of the unicorn plant, and still other varieties of wild potatoes and onions are procured at this time.

A number of grasses and other plants (among them dropseed grass, tumbleweed, pigweed, spurge, and sunflower) are harvested for their seeds. Most of these are hand threshed as previously described, or a large amount of the seed-bearing tops is cut, put on a hide, dried, and beaten with a stick. The largest stems and leaves are picked out by hand, and the remainder winnowed "by letting them fall to a hide from a tray basket." The same end may be attained by "tossing the seeds in a hide; then the leaves are blown away."

To obtain sunflower seeds in quantity, the woman fills her burden basket with the flowers and later lays them out to dry at home. When the plants are thoroughly dried, the seeds can easily be shaken out. Or, if the seeds are very ripe, the back of the sunflower head is shaken or is given a sharp blow with a stick, and the seeds fall into a burden basket which has been placed under the plant. These seeds are ground up and are added

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When the head is used for food, one way to fix it is to dig a hole, line it with rocks, and build a fire in there. It makes lots of ashes. Put the head in on top of the ashes and grass on top of the head. Sprinkle the grass with water and cover with dirt. Let it roast a day or a night. Usually the tongue is taken out first. 252 262

Sometimes the feet, liver, and entrails are placed in the earth oven with the head and are cooked with it for a day or a night.

The pit is used, too, for cooking fetal deer and antelopes, which are considered a delicacy. "The unborn of deer and antelopes are good eating. The meat is soft and has a good taste. We don't steam grown animals in an underground oven. But we do do it to a deer not yet born. This can also be prepared like any other meat, however."

Although the intestines are not so well liked as other parts, the hunter usually brings them home:

The intestines are much better if the animal is fat. We don't care much for the intestines anyway if we have plenty of other meat. If the hunter is loaded up on returning from the hunt, he does not bother with the intestines, especially if the animal is not fat. When he brings the intestines home, the hunter turns them over with the other meat to the woman who is going to cook it. She takes the outside off, working downward and squeezing out any waste left as she does so. Then she cooks them without washing them. Now the young people turn them inside out and wash them. [198]

Intestines are cooked over the coals. Another good way to cook them is to stuff a piece with meat and fat. The woman puts sticks through each end so the filling won't come out. Then she puts it on a hot stone by the fire to cook. The windpipe of an animal is stuffed in this same way too. But the intestine is used just in an emergency when food is scarce. Now when we kill a sheep we throw away the intestines. We save only the liver and sometimes the heart from the inside.

Liver is usually thrown on the coals of an open fire and roasted. Sometimes a sort of "blood sausage" is made. The hunter fills the paunch with the blood of the animal he has killed and brings it home. Then the woman "adds fat and onions and puts it in the coals or in a pot, cooking it until the blood gets thick and tastes like liver. She punctures the stomach so it won't explode. She puts in some of the little red chili peppers that grow in the mountains of Old Mexico. These are small, like marbles." [263] When it is not used in this way, the stomach is seldom eaten:

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The crowns of this species were gathered any time from the middle of March to the end of summer, the portion of the stem from the ground to the leaves being peeled and baked overnight in an underground oven in a manner similar to that in which mescal was prepared. The yellow-to-brown baked product was known as *nigahe.* After being dried in the sun, broken into pieces, and softened in water the rather sweet product was ready to be eaten. The tender central leaves of the related datil *(Yucca baccata)* were cooked in soups, boiled with meat, and used in various similar combinations.

The large flowers of the narrow-leaved *Yucca elata* were also boiled and eaten as a vegetable, but the less palatable ones of the broad-leaved *Y. baccata* were eaten only if they could be obtained before the summer rain, since the Apache maintain that they are bitter thereafter.

The fruits of several species of Yucca were also utilized as food. The somewhat banana-shaped fruits of the datil *(Y. baccata),* as well as of the palma *(Y. macrocarpa)* were gathered before they were fully ripe, laid on grass *(Andropogon furcatus)* on the ground, covered with the grass, and allowed to finish ripening in the sun. After roasting in hot ashes the hard black covering was stripped off, the fruit split lengthwise and the seeds removed. The white pulp was then ground and made into large cakes, which might be stored indefinitely. Frequently the roasted fruit was pounded to pulp on an animal hide and allowed to drain in a basket placed over a pan. The juice might be drunk or poured over and mixed with the cake pulp, making the latter soft and sticky as well as aiding in preserving it. In either case the pulp was spread on Yucca leaves to dry for two days in the sun, being always adorned with sunflower blossoms to "make it pretty." The Indians prayed while placing the sunflowers, the ceremonial significance being that the sunflower was used as a symbol of the fructifying influence of the sun, and this use constituted a prayer that the sun continue to make the yield plentiful year after year. The Mescalero Apache tell of a Yucca which grows near El Paso and has a "white" fruit and sweet sticky buds. They were

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263 picked, cut open, dried on sticks, and used in sweetening different foods.

262 [178] The fruits of various genera of cacti are still used as food but no longer constitute an important article of diet among these Apache. Formerly the Chiricahua Apache, [137] who ranged in western New Mexico, southeastern Arizona, and to the south in Old Mexico, utilized as food the fruit of the sahuaro or giant cactus *(Carnegiea gigantea)* and of the organ-pipe cactus or pitahaya dulce *(Lemaireocereus thurberi)*. Their name for it was *madaya*, an Apache corruption of pitahaya. [171] The gathering and utilization of these fruits by the Chiricahua Apache was not unlike that reported by Castetter and Underhill *(5:*21) for the Papago; [184] the reader is referred to that paper for a discussion of the subject. The Mescalero Apaches never have used these species as they do not grow within their present or past range.

252 262 [413] [824] [251] [824] The ripe fruit of a number of species of Opuntia, prickly pear cactus, was commonly utilized as food. The ripe fruits, or tunas, were removed with a pair of wooden tongs, made by doubling a pliable branch, and cleaned of spines with a brush of stiff stems of sacaton grass *(Sporobolus wrightii)* while held with the tongs. The fruit was then placed in burden baskets and taken home to be eaten fresh or dried and stored. To dry, the fruit was split lengthwise, freed of seeds, and placed on big blue stem grass *(Andropogon furcatus)* in the sun. Sun-dried fruit was usually boiled before eating, although soaking in water sometimes softened it [251] enough for use. Sometimes, after the seeds were removed, the fruit was mashed into a pulp and stored in this caked [153] form. Many of the Indians of the Southwest contend that these tunas or nopales must be eaten with discretion as too much of the fruit causes a fever; Bourke *(2:*44) corrobor- [222] ates this. The Chiricahua and Mescalero Apache women [482] collected the tunas in large baskets carried on their backs, suspended from a tumpline which rested on the upper part [251] of the chest. The split fruit was spread out to dry in the sun. Tunas formerly constituted a very important Apache food.

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252 262 137 way. Children commonly ate the sweet bark of sumac *(Rhus cismontana)* as a delicacy.

263 222 137 Not unlike the above was the obtaining of sugar from the box elder maple *(Acer negundo)*. In olden times, before sugar was easily obtainable commercially, these Indians secured material for sweetening by boiling the inner bark, and outer portions of the wood just beneath the bark, until [251] the sugar which it contained crystallized out. Also scrapings from the inner bark were dried and placed in the *xel* (parfleche) for winter use. Likewise sap from the New Mexico maple *(Acer neomexicana)* was collected and boiled to obtain syrup and sugar.

252 262 137 A number of species of fruits were occasionally eaten but did not constitute important Apache foods. Among these were strawberries *(Fragaria bracteata)* and the purplish fruits of the wild privet *(Forestiera neomexicana)*, which were always eaten without preparation. Raspberries [251] *(Rubus arizonicus)*, mulberries *(Morus microphylla)*, and hawthorne fruits *(Crataegus cerronis)* were either eaten fresh or pressed into pulpy cakes, dried, and stored for winter use.

Wild gooseberries and currants were quite commonly used. The purplish red fruits of the spiny-fruited gooseberry *(Ribes pinetorum)* has a pleasant acid flavor when ripe in September, at which time the spines may be easily [251] brushed from the fruits. They were ground and compressed into cakes for winter consumption. Another gooseberry *(R. leptanthum)*, which has smooth fruits, somewhat larger than the former species, was eaten fresh or made into cakes for use during the winter. This species was the most eagerly sought because of the size of its fruits. The rather insipid fruits of two species of black currant, *Ribes wolfii* and *R. mescalerium*, were at times eaten without preparation [251] by these Indians. Fruits of the former, in earlier times, [108] were ground, dried, and pressed into cakes for storage, but are now used for jelly; those of the latter species, however, are usually cooked. Grapes *(Vitis arizonicus)*, which grow

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ent time. They are not only eaten without preparation but are boiled and quite frequently cooked with meat or just the bones of animals, in combination with green chile and onions. Wood sorrel *(Oxalis violacea)* is often mixed with other leaves to be cooked or is eaten raw. The tops of fetid marigold *(Dysodia papposa)* and shepherd's purse *(Capsella bursa-pastoris)* are also used as greens, either cooked alone or with meat.

The young white rootstocks of cat-tail *(Typha latifolia)* were frequently gathered in the spring of the year and cooked with meat, as were the corm-like tubers of the sedge *(Cyperus fendlerianus)*. These were peeled and cooked or eaten raw. The Apache name for the last species, "feed to horse," was so given because the flowers and seeds were salted and fed to horses, and were said to be very fattening. The bulbs of wood-sorrel *(Oxalis violacea)* were eaten raw or, when abundant, were boiled. The raw fleshy roots of chimaja, also known as wild celery *(Cymopterus fendleri)*, were also utilized.

Leaves of dragon-head *(Dracocephalum parviflorum)*, the mint *(Mentha penardi)*, horsemint *(Monarda menthaefolia)*, and the pennyroyal *(Hedeoma nana)* were commonly used for flavoring. These Apache say that if they had no pepper this last named species was substituted in soups, but was not added until the soup had finished cooking. They also used the mint to keep water "cool," but probably meant that it made water more palatable to drink by imparting to it a cooling flavor. Hops *(Humulus lupulus neomexicanus)* were gathered in October, boiled, and used for flavoring in a considerable variety of ways. Formerly they were mixed with mesquite and screw bean flour (see p. 41) but at present they are mixed with wheat flour; they were also combined with wild potatoes to give flavor. More commonly they were used to flavor *tulbai*, the drink made from fermented maize. Wild onions *(Allium cernuum* and *A. geyeri)* flavored soups and gravy but were occasionally eaten raw. A sage, *Artemisia ludoviciana*, was also a flavoring substance for meat. A plant in very common use by vari-

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263 137 ous Indian groups of the Southwest was chimaja, also known as "wild celery" *(Cymopterus fendleri)*, and these Apache used the leaves for flavoring soups and meats. It was gathered when in flower or seed and had a mild flavor intermediate between that of celery and carrot. The leaves were used [262] [252] in combination with other green plant parts and the roots were eaten raw.

262 252 137 Seeds of many plants held an important place in the Apache diet, one of the more important ones being red root or tumbleweed *(Amaranthus graecizans)*. The inflorescences were pulled from the plant, threshed by rubbing between the hands, and the seeds winnowed and ground to make flour for bread. Other species of Amaranthus, especially *A. retroflexus*, the pigweed, were similarly utilized. Four species of grass—dropseed *(Sporobolus cryptandrus)*, *Muhlenbergia* sp., *Panicum bulbosum minor*, and grapevine mesquite grass *(Panicum obtusum)*—were also used for food, the seeds of the first three being threshed, winnowed, and ground into flour for bread. Seeds of the dropseed grass were boiled and eaten as porridge, while those of *Panicum obtusum*, as well as *Panicum bulbosum*, were ground to make gravy and mixed with meat. The small seeds of the shepherd's purse *(Capsella bursa-pastoris)* and fetid marigold *(Dysodia papposa)* were secured by cutting off the tops of the plants and beating them on a hide. Then [251] the seeds were winnowed in a basket tray in the wind. After drying they were stored and, when needed, ground into flour for bread. Sometimes the seeds were roasted without grinding and combined with other foods.

Ripe sunflower seeds *(Helianthus annuus* and *H. canus)* were gathered in the fall of the year by threshing. Those of the former species were also harvested when dead ripe, by women, who placed a basket under the plant and sharply struck the back of the sunflower head with a stick, knocking the seeds into the basket. They were sometimes ground and the flour used for a thick gravy, but more commonly this was sifted, made into dough, and baked on hot stones or in hot ashes. This kind of bread is still in common use. Cre-

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273 [192] ceremonies. The Spanish-American name is *tesvino*, probably connected with *vino*—wine, and the Americans have altered it to *tiswin*. *P'tiswing* was evidently another modification of *tesvino* or *tiswin*. The Indians, many of whom spoke Spanish, often used the term *tesvino* and now often use *tiswin* instead of the native term. *Tulapai* and *twiltkah-yee* were probably attempts of the whites to pronounce the native name. To make the beverage, shelled maize was soaked in water for about twenty-four hours and placed in a narrow trench lined on both sides with grass. The maize was covered with grass and soil, then with a blanket; or sometimes the blanket was laid directly over the corn without the use of grass and soil. Each morning the trench was sprinkled with water to facilitate the germination of the maize. When the corn-sprouts were about one and one-half inches long the seedlings were removed from the trench and finely ground twice between two rocks, then boiled in water until the mixture was reduced to half the original quantity. Enough water was added to fill the vessel and the liquid again boiled for a short time (until about two inches from the top of the vessel), strained through a cloth (at present a flour-sifter is often used), and cooled. It was allowed to ferment in a water jar until about noon of the next day, when it was ready for consumption. According to Hrdlička (*11*:191), as well as Browne (*3*:411), the general practice was to place the mash in a jar that previously had been used for brewing and which was never washed, the pores of the vessel retaining the organisms necessary to start fermentation. In the absence of sugar, mesquite flour (*Prosopis glandulosa*) [263] or sahuaro syrup (*Carnegiea gigantea*) was used as sweetening. This finished product is known as *tulbai* and must be drunk within a few hours after it is prepared or "it gets weak and is no good." In other words, the alcohol is converted into acetic acid, giving the beverage a sour taste.

273 462 Mention should be made here that the preparation of this beverage was the woman's work and prerogative, and men seldom had anything to do with the brewing. Some of

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from our informants that these Apache ever distilled this or any other alcoholic beverage.

Both sotol and mescal beverages were reported as being older than *tulbai*. Informants said that they learned the use of *tulbai* from the Lipans and the Yaqui.

Another mildly intoxicating alcoholic beverage formerly prepared, although at present not in common use, was made by finely grinding cooked mesquite *(Prosopis glandulosa)* pods and seeds. A little water was added during the grinding process and more to the ground mass, then the mixture allowed to ferment for a day and a night. This is a very old drink among the Apache.

These Apache formerly prepared and still make pinole as a very common drink. The fresh fruits of screw bean *(Strombocarpa pubescens)* were ground and to the meal was added some sweetening substance (sugar is now used) to make a thick drink. Another method of preparation was boiling the fruit until it got soft, making a sort of gruel, then adding the sweetening substance and drinking it.

The fruits of a number of species of Opuntia or prickly pear cactus were and still are mashed, the juice extracted and drunk, without fermenting, as a refreshing beverage which was regarded as very healthful. Non-intoxicating beverages were also made by boiling the leaves and young stems of the sage *(Artemisia aromatica)*, *Leucelene ericoides*, horsemint *(Monarda menthaefolia)*, pennyroyal *(Hedeoma nana)*, as well as the leaves of the lip fern *(Cheilanthes fendleri)* and cota *(Thelesperma gracile)*. This last named species which the Apache call "tea" has been extensively used in common with practically all Indians of southwestern United States, from ancient times down to the present, to make a beverage. Portions of the plant were wrapped into small bundles and might be used fresh or stored indefinitely. When boiled in water a red liquid was produced and was usually consumed without being sweetened, although the addition of a little sugar made the drink even more palatable. A drink used much as is coffee, made by boiling the fresh leaves of mariola *(Parthenium in-*